pain), which is a patient-oriented outcome measure for knee OA with sufficient reliability and validity, similar to WOMAC and SF-36, was also used to evaluate pain severity and activity of daily living. Both spearman's rank correlation analysis and partial correlation analyses adjusted for age and BMI were conducted to examine the relationships between the severity of depression and the several clinical manifestations of the patients with knee OA. The several clinical manifestations were compared using parametric comparisons analysis of variance (ANOVA). Significant differences were evaluated if ANOVA was significant. A p-value of less than 0.05 was considered to be statistically significant.

Results: Pain VAS score and JKOM scores of the patients were increased dependent upon the severity of knee OA. However, SDS score, serum levels of both IL-6 and hs-CRP were not associated with the severity of knee OA. There was positive correlation between SDS score and pain VAS score ($r = 0.28$, $p < 0.001$) and JKOM-pain score ($r = 0.29$, $p < 0.001$). Serum levels of IL-6 were also correlated with SDS score ($r = 0.18$, $p = 0.003$), while no correlation was observed between SDS score and serum levels of hs-CRP ($r = 0.10$, $p = 0.22$). Furthermore, age and BMI adjusted partial correlation analysis also showed the positive correlations between SDS score and serum IL-6 ($r = 0.25$, $p = 0.002$), pain VAS score ($r = 0.26$, $p = 0.002$) and JKOM-pain score ($r = 0.26$, $p = 0.002$). No significant correlations were observed between SDS score and serum levels of hs-CRP ($r = 0.10$, $p = 0.24$) by the age and BMI adjusted partial correlation analysis.

Conclusions: The results of the current study indicate that there is an association between the severity of depression and the severity of pain in patients with knee OA. Furthermore, the severity of depression is associated with the severity of inflammation. Serum levels of IL-6 are reflected to the severity of synovitis and associated with pain in patients with knee OA. In addition, serum levels of IL-6 have been reported to be a predictor for the onset of depression. Based on these results, the severity of depression may be affected by the severity of synovitis in patients with knee OA. In conclusion, there is an association between the severity of depression and the serum levels of IL-6 in patients with knee OA.

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NEUROPATHIC AND PSYCHOLOGICAL FACTORS IN SYMPTOMATIC PATIENTS WITH HIP DISEASES: COMPARISON BETWEEN OSTEOARTHRITIS, FEMOROACETABULAR IMPINGEMENT AND HIP DYSPLASIA

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Purpose: Osteoarthritis of the hip with advanced changes on radiographs is widely accepted as the leading cause of significant symptom and functional disability in the hip joint. Without radiographic evidence of osteoarthritis, hip dysplasia (HD) and femoroacetabular impingement (FAI) are also recognized as relevant causes of hip symptom and targets of surgical interventions. Reliable correlations between hip symptom and radiographic osteoarthritis were established, however, accurate diagnosis in non-osteoarthritic FAI and HD as true source of hip symptom is challenging, due to unspecific manifestations of symptom and lack of established associations with labral or cartilage damages. Without accurate assessment of source of hip symptom, pharmacological or surgical treatments for those pathologies may result in unfavorable outcomes.

Recent multi-discipline approaches showed that damage or dysfunction of the nerve system (neuropathic mechanism) and psychological problems are partly associated with low back and knee pain. Our objective was to examine associations of neuropathic and psychological factors in symptomatic FAI and HD patients as possible causes of hip symptom, using osteoarthritis (OA) patients as reference.

Methods: Consecutive 98 symptomatic patients including hip OA ($N = 50$) at the Kellgren–Lawrence (KL) grade of 2 or more, non-osteoarthritic HD ($N = 30$), and non-arthritic FAI ($N = 18$) on radiographs were studied. Patients with history of hip surgeries, acute traumatic events, suspicion of infection or tumorous diseases, and neuromuscular diseases were excluded. In hip OA patients, there were 9 hips at the KL grade of 2, 14 hips at the KL grade of 3, and 27 hips at the KL grade of 4. In HD patients, mean center-edge (CE) angle on radiographs was 16 ± 8.6 degrees. In FAI patients, there were 9 cam-type hips, 6 pincer-type hips, and 3 mixed-type hips. Visual Analogue Scales of pain (VAS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Brief Scale for Psychiatric problems in Orthopaedic Patients (BS-POP) for psychological assessment, and the Neuropathic Pain Screening Questionnaires (NPSQ) for neuropathic assessment were compared among the three groups.

Results: There were no significant differences of VAS, WOMAC pain and stiffness scores among the three groups. In the OA, HD, and FAI groups, psychological problems were indicated in 22%, 39%, and 37% of patients, and presence of neuropathic factors were highly suspicious in 10%, 10%, and 19% of patients. There was no significant difference regarding psychological problems and neuropathic factors among the three groups. In NPSQ, scores of "burning sensation" and "numbness" were relatively higher in the FAI group, as compared to the other two groups. In BS-POP, the scores of "specific way of indicating symptom by patients" and "pain over the whole symptomatic area" were significantly higher in the HD group, and the score of "patient's bad attitudes for recommendations of examination or treatment" was significantly higher in the FAI group, as compared with the OA group ($p < 0.05$). VAS and WOMAC pain scores had mild correlations with NPSQ scores ($r = 0.43$–0.48, $p < 0.001$).

Conclusions: Among symptomatic FAI and HD patients, over one-third had psychological factors and nearly one-seventh had neuropathic symptoms. In addition to surgical and exercise treatments, systematic treatment strategies incorporating medications and psychotherapy effective for neuropathic and psychological factors may be more important in non-osteoarthritic patients.

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DEPRESSION COMPLICATED WITH KNEE OSTEOARTHRITIS

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Purpose: The symptoms of knee osteoarthritis (OA) are often associated with significant functional impairment, symptoms of inflammation, including pain, stiffness, and loss of mobility, disability and diminished activity in daily life and a diminished overall quality of life for OA patients. There are no current interventions proven to restore cartilage or curtail the disease processes, and OA ultimately results in joint destruction, chronic pain, disability, and other associated conditions such as depression and social isolation. Depression is speculated to be related to pain in knee OA and may affect the outcomes of treatment for knee OA. While the pain severity and pain related factors in knee OA may change dependent upon the progression of the disease, it still remained unclear whether depression in patients with knee OA also change dependent upon the progression of the disease. The purpose of this study was to investigate both the prevalence and severity of depression among patients with knee OA and to clarify the relationship between depression and both the radiographic disease progression and the severity of pain in patients with knee OA.

Methods: A total of 250 patients (mean age 70.7 years) who consulted our out-patient clinic for knee pain between October 2009 and November 2012 were enrolled in this study. All patients had knee OA Kellgren–Lawrence (K/L) grade of 2 or more with no history of being examined for mental disorder. The Zung self-rating depression scale (SDS) was used to evaluate depression with scores greater than 40 indicating a state of depression. Patients were divided into the K/L 2 group (93 patients), K/L 3 group (79 patients) and the K/L 4 group (78 patients). After examining the relationship between the severities of knee OA and the presence or absence of depression, SDS score of these three groups was compared. Visual Analog Scale scores for pain (pain-VAS score) were then compared between the two groups divided according to the presence or absence of depression. Independence was tested using the chi-square test. While multiple comparisons between the three groups were performed using a Bonferroni test, a t-test was used for the comparisons between two groups. All statistical analyses were performed using the SPSS 21J software program.